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14. ABSTRACT

The aim of the research is to develop and evaluate the effects of a new training program – the Social Awareness & Action Training (SAAT) – on soldier resilience and performance prior to, during, and following deployment. In Phase 1 (Months 1-6), we adapted and evaluated the SAAT. Focus groups for the SAAT program were conducted at Fort Bliss in June 2011, resulting in revisions to the training. To determine the intervention effectiveness and safety, we then trained four staff members to perform a preliminary SAAT study at Fort Lewis in September, 2011 to evaluate post-treatment social resilience in the Intervention Group (Social Fitness Training) compared to an active Control Group (Cultural Awareness Training). Results revealed small effect sizes. In consultation with CPT Paul Lester from CSF and COL Amy Adler, LTC Dennis McGurk, and LTC Jeffrey Thomas at WRAIR, we revised the Social Fitness Training and performed a second pilot study using a pretest-posttest design at Fort Sill in March, 2012. Results revealed moderate to large effect sizes of the training on our measures, and preparation for Phase 2 (e.g., final revisions to the training, preparation of materials the Soldiers, identification and training of the trainers, etc) has begun.

15. SUBJECT TERMS
 Social resilience, Cohesion, Leadership, Isolation, Depression, Perspective Taking

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Social Awareness and Action Training (SAAT)

Introduction

In January 2011, an article we prepared on Social Resilience in the military appeared in a special issue of the *American Psychologist* (Cacioppo, Reis, & Zautra, 2011). This article defined social resilience and outlined how social resilience differs from individual or emotional resilience and how it is a more substantive set of skills than making friends. Much of the theory underlying the SAAT comes from this article.

The SAAT Study was approved for funding on 28 February 2011, and funding for the project began on 1 April 2011. The objectives for the first quarter were to: (a) hire, organize, and train staff; (b) develop working drafts of the Intervention Condition (Social Resilience intervention arm of the SAAT) and the Control Condition (Afghanistan Geography, History, and Culture arm of the SAAT); (c) complete a draft of the computerized surveys using the same equipment and format as is used in the GAT; and (d) vet the training materials and measures in four focus groups, each consisting of 8-12 soldiers from a combat brigade. With the Appropriations Bill for FY11 still in Congress and CSF training (IDIQ) funds unavailable at this start date, we were advised to rebudget Year 1 funds to perform Phase 1. We also prepared the subcontracts for Techworks, Arizona State University, and RSG, and we identified staffing for the SAAT, and we secured IRB approval for the SAAT from the University of Chicago, Arizona State University, and the Army.

The social resilience intervention (termed "Social Fitness Training" or SFT - four 2-hour training modules designed to build social resilience at the level of the individual soldier and at the level of the platoon) and the training materials for the active control group (termed "Cultural Awareness Training" or CAT - four 2-hour training modules matched in terms of design elements, soldier contact, and expression of positive expectations that provides accurate and useful information on the geography, history, and culture of Afghanistan) were prepared and harmonized to ensure comparability of the two arms of the clinical trial (e.g., length of training, method of instruction, contact with the Trainer, measurements taken) except for training content. In addition, a training script and training booklets were developed for the SFT and CAT. Relatedly, the scripts for the trainers, curriculum for training the trainers, and training manuals for the SFT and CAT were developed.

The pretest and posttest surveys were prepared, computerized, and instituted to permit rapid acquisition and transfer of these data through a secure network to a secure database. Specifically, we have worked with our subcontractor at Techworks to implement our measures in computer surveys that have the look and feel of other Army surveys that soldiers are asked to complete as part of the CSF effort. In addition, we prepared the statistical analysis routines (including data checks) to be used in the research, we specified what level of data we need from these surveys (i.e., item-level information), and we verified through simulations and two pilot studies that the data are being collected, transmitted, and analyzed quickly and without error.

Fort Bliss Focus Groups

The focus groups were conducted at Fort Bliss in 13-16 June. We received feedback on SFT and CAT, and revisions in the materials were made based on this feedback. The primary goal of the resilience training is to reduce loneliness (increase social resilience at the level of the individual), as this is known to have subsequent effects on depression and stress levels. A secondary goal is to increase squad cohesion (increase social resilience at the level of the squad). To gather some preliminary data on these goals, we measured loneliness, squad cohesion, stress, and depressive symptoms prior to going through the intervention and at the end of the first day, at which time the soldiers had gone through about three quarters of the intervention. The results are plotted in the Figure to the right. The SFT lowered levels of loneliness by the end of the first day. Nonparametric tests confirmed this finding: two soldiers did not change their level of loneliness, four increased their reported

Change Score (Time 2 - Time 1)
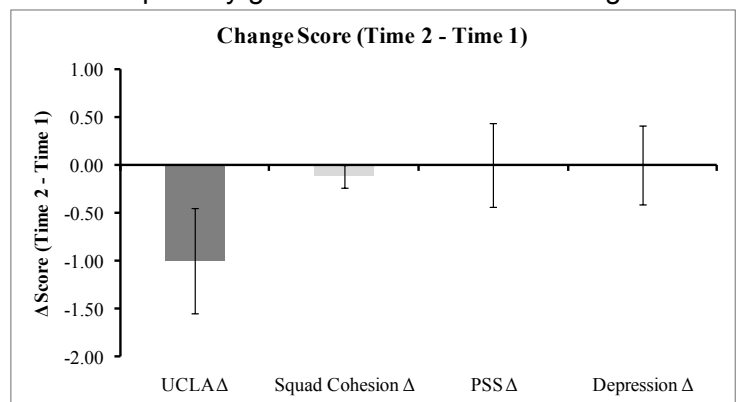
loneliness, and eleven decreased their level of loneliness. Note, squad cohesion was unchanged, but the soldiers in the focus groups were from different platoons. The pilot study and formal randomized clinical trial will be implemented at the level of the platoon, where the training can operate at the level of the platoon, as well. Finally, we received very positive feedback on the quality and utility of the Control condition (vets from Afghanistan expressed the sentiment that this training would have helped them in during their deployment in Afghanistan), and we determined that the pretest and posttest were engaging and comprehensible.

We made revisions to SFT and CAT, including the filming of soldiers sharing their own stories of social resilience that became part of the training materials. We met in Phoenix on 6-10 August to lock down the training materials and to train the trainers who will be performing the pilot study, which was scheduled by FORSCOM for Fort Lewis in mid-September. During the meeting in Phoenix, we found possible issues with our subcontractors at RSG and ASU. We reported these issues to Dr. Holly Campbell at MRMC, CPT Lester at CSF, LTC McGurk and LTC Thomas at WRAIR, and the Office of Research at the University of Chicago. The latter undertook an audit of the performance of the subcontracts. We were advised to terminate these subcontracts at the end of Phase 1, which we did. The functions that were to be performed by these subcontractors were assumed by me and my staff at the University of Chicago.

Fort Lewis Pilot Study

The first Pilot Study was performed at Joint Base Lewis McChord drawing troops from 8 platoons, 6 from infantry and 2 from light artillery, to evaluate post-treatment social resilience in the SFT Group compared to CAT Group. The experimental design proposed as a randomized clinical trial with an active (education) control group. During the process of developing these materials, however, we realized that SFT could conceivably increase outgroup biases while increasing ingroup cohesion. We, therefore, created a CAT that was designed to reduce outgroup biases, as measured by ratings of the warmth of Afghans. The notion was to provide training for social fitness to be followed by training in cultural awareness to mitigate or reverse any outgroup biases that may result from increasing ingroup cohesion in the SFT. Thus, the experimental design became a randomized double-dissociative clinical trial in which SFT was hypothesized to improve perceived isolation, perceived stress, and depressive symptoms, whereas CAT was hypothesized to lessen prejudicial perceptions of Afghans. BG Rhonda Cornum and CPT Lester at CSR and LTC McGurk and LTC Thomas were informed of this change. Briefly, the double dissociative randomized clinical trial ensures that any nonspecific effects of training (e.g., placebo, Hawthorne) are experimentally controlled across the two arms of the clinical trial and ensures that the participants do not become aware of serving in a "control group."

The SFT and CAT programs were implemented at the level of the platoon, with 8 platoons participating in eight hours of training. Assignment of platoons to Condition was stratified so that infantry platoons within a Company were randomly assigned to SFT and CAT. We determined that each Company had returned from Afghanistan at the same time and had similar assignments in the same region while in Afghanistan, the assignment to condition was random with this constraint to minimize cross-treatment contamination by Soldiers speaking with one another. In addition, there were two field artillery groups from the same Company. One group consisted of 18 Soldiers from the 1st and 2nd Platoons of a Field Artillery Battalion, and the second group consisted of the 1st Platoon of another Field Artillery Battalion. Given the social fitness targets the social interactions within an extant platoon, the latter platoon was placed in the Social Fitness Condition, and the other group was placed in the Cultural Awareness Condition. Analyses of baseline data revealed these groups were comparable on baseline measures. The specifics of platoon assignment, therefore, were as follows.

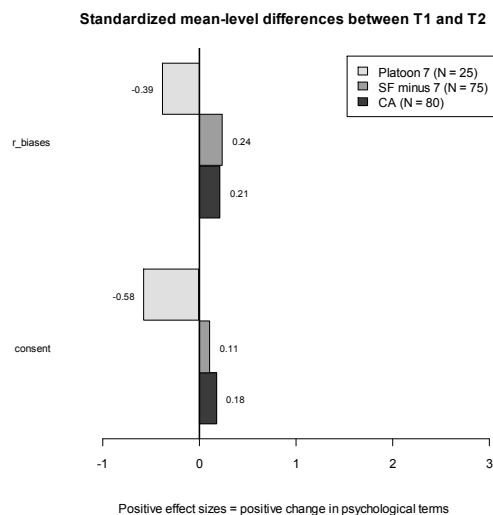| Platoon	Actual Platoon Name	Group/Hour/ Trainer/Room
2-12FA (B BTRY MixedPLT) N=18	Platoon1 from a Field Artillery Regiment	Cultural Awareness / 0800 / Bell / 215
1-38IN (CCO1PL) N=32	Platoon2 from an Infantry Regiment	Social Fitness/ 0800 / Huff / 214
1-38IN (CCO2PL) N=34	Platoon3 from an Infantry Regiment	Social Fitness / 1000 / Bell / 214
4-9IN (A CO3PL) N=28	Platoon4 from an Infantry Regiment	Cultural Awareness / 1000 / Davis / 215
4-9IN (ACO2PL)	Platoon5 from an Infantry	Cultural Awareness / 1300

N=32	Regiment	/ Bell / 215
2-12FA (A BTRY 1PL) N=16	Platoon6 from a Field Artillery Regiment	Social Fitness / 1300 / Huff / 214
1-38IN (CCO 3PL) N=32	Platoon7 from an Infantry Regiment	Social Fitness / 1500 / Davis / 214
4-9IN (BCO2PL) N=20	Platoon8 from an Infantry Regiment	Cultural Awareness / 1500/ Huff / 215

The average time to complete the surveys was approximately 45 minutes for the pretest and 30 minutes for the posttest. There were no technical issues that couldn't be fixed immediately, and the University of Chicago and TechWerks staff worked flawlessly as a team. 183 Soldiers completed the posttest: 180 (84.5 %) of the 213 Soldiers who had completed the pretest and three additional Soldiers who were not available at pretest. We were able to determine why Soldiers did not complete the posttest. One person became a father during training. One person was in the hospital. One person had to do a drug urine test. One person went to jail. The remaining missed the posttest because their commander tasked them with completing other missions around the Post. Analyses confirmed that attrition was unrelated to experimental condition.

Of these 183 Soldiers, 88% consented to the use of their data for research purposes. However, we received IRB consent to analyze all of the data when reporting to the Army on the results of the training. The results reported here are not for research purposes but are to evaluate training efficacy for the Army. Therefore, all data were subjected to analyses. Of the 183 Soldiers, we detected patterns denoting meaningless responses (e.g., Christmas tree responding) in 12% of the cases. The results are based on data from the remaining Soldiers.

We began by conducting preliminary analyses to investigate possible effects for Trainer, Platoons, and Time of Day. Results revealed no notable differences at the pretest. However, an inspection of the notes taken by an observing staff member during training suggested Platoon 7 was unusual. Platoon 7 was an Infantry Platoon in the Social Fitness Condition, and in Session 1, the senior NCO made his view known that emotions are not useful, and Soldiers do not need anyone. In Session 2, this NCO announced that, "If you're weak you don't belong in this uniform, you don't belong in this Army, you don't even belong in this Society." In Session 4, the NCO began the first break by berating the platoon.

By the end of the posttest, Soldiers in the Social Fitness (SF) and Cultural Awareness (CA) training were generally more willing to allow their data to be used for research and to reduce their meaningless responding. The exceptions were Soldiers in Platoon 7, who showed substantial increases in meaningless responding (r_biases) and refusals to permit their data to be used for research (consent). These data are summarized below.

Standardized mean-level differences between T1 and T2

Legend:
- Platoon 7 (N = 25)
- SF minus 7 (N = 75)
- CA (N = 80)

r_biases:
- -0.39
- 0.24
- 0.21

consent:
- -0.58
- 0.11
- 0.18

Positive effect sizes = positive change in psychological terms

We, therefore, examined the data in two ways – with Platoon 7 in the Social Fitness Condition per random assignment, and with Platoon 7 separated to permit inspection of the influence of data from this unusual platoon on the overall results.

We analyzed the data using a multi-level regression modeling approach with one between-subject factor (Condition: Social Fitness vs. Cultural Awareness) and one within-subject factor (Measurement Period: Pretest vs. Posttest), and with Soldiers nested within platoons. Unless noted otherwise, the effect sizes for the dependent variables reviewed here are transformed so that positive effect sizes reflect positive psychological changes (e.g., decreased response biases, increased consent, reductions in loneliness, increases in squad cohesion).

Did SFT Increase the Social Tools Soldiers Possessed? In the posttest, all Soldiers were asked to indicate the extent to which the SAAT training improved their ability to (1 = strongly disagree, to 5 = strongly agree):
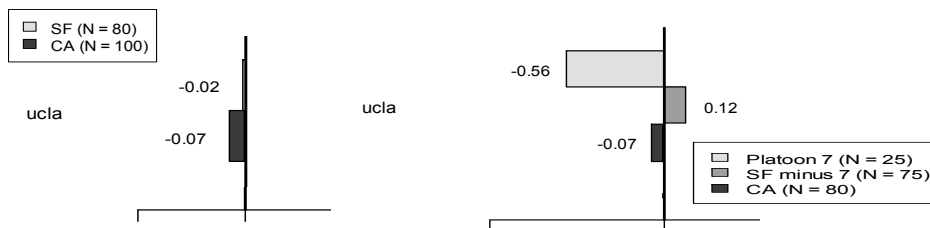1. Find people to talk to.
2. Find ways to become part of a group.
3. Get "in tune" with other people around me.
4. Find companionship.
5. Find ways to build good connections with others.
6. Find people I can turn to.

Responses to these questions were averaged to provide an index of perceived changes in social fitness. Analyses of this index, summarized below, showed that Soldiers who went through SFT felt they had improved their social abilities and intelligence more than Soldiers who went through Cultural Awareness training. Soldiers in Platoon 7 fell between Cultural Awareness training and the other platoons in SFT and did not differ from these groups. The effect size for this difference was large, Cohen's d = .37 for the randomized groups (see left panel, below) and d = .44 when the data from Platoon 7 are removed (see right panel, below).
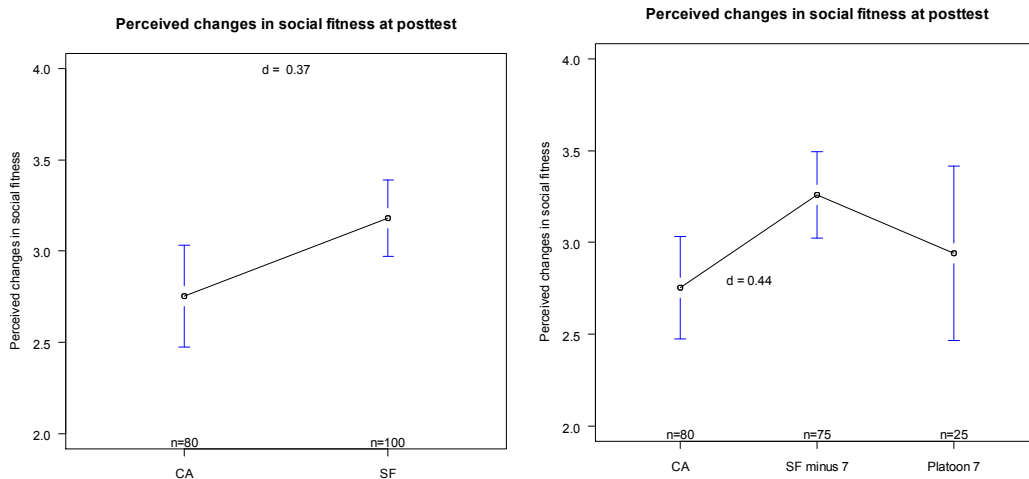
Did SFT Improve Feelings of Social Isolation? The analyses above indicated that Soldiers who went through SFT reported that they were now better able to deal with isolating conditions. Soldiers completed their training on Friday and completed the posttest on Monday. Therefore, there was little time for them to implement these new capacities. Nevertheless, the analyses revealed the expected small effect size for SFT on the measure of perceived social isolation (ucla = loneliness). The difference in the effect size for the two experimental conditions was .05, showing that the beneficial effects of SFT on loneliness approximated the effect sizes found in many public health interventions. When we analyzed Platoon 7 separately, the pre-post effect size for the remaining platoons receiving SFT was .12, and the difference in effect size for Social Fitness versus Cultural Awareness training grew to .19.

Standardized mean-level differences between T1 and T2

Positive effect sizes = positive change in psychological terms

...raumatic stress.
...diers felt at the
...ed to the severity
...average but also

...consistent
...s. For instance,
...permit the effects
...follow-up
...ables.

The next graphs summarize the effect sizes for squad cohesion (scs). Again, we do not expect much change in these measures immediately following training because the platoons have not had the opportunity to interact as a unit since training was completed. As displayed below, training generally produced nominal improvements in squad cohesion, although Platoon 7 showed significant reductions in squad cohesion. Given the NCO's comments directed toward the Soldiers during the training, this may have more to do with the leadership of the platoon than with any training that was performed. Overall, these results suggest that squad cohesion is increased when platoons undergo new training or experiences together.

Standardized mean-level differences between T1 and T2
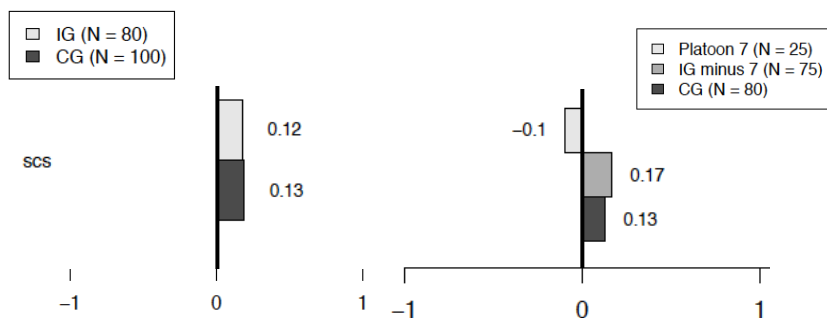
Positive effect sizes = positive change in psychological terms

Did Cultural Awareness Training Reduce Outgroup Prejudice? The Cultural Awareness training was developed to also have salubrious social effects, but on measures of hostility toward Afghans, not on measures of social fitness. That is, in this double dissociative clinical trial design, Social Fitness, relative to Cultural Awareness training was hypothesized to benefit Soldiers on measures of social fitness, whereas Cultural Awareness was hypothesized to benefit soldiers on measures of prejudicial perceptions of Afghans. Analyses revealed that our Cultural Awareness training had the predicted effects specifically on the measures of knowledge of and prejudice toward Afghans.

The Figures depict the effect sizes for knowledge about Afghan people, geography, and culture (ca). As hypothesized, Soldiers who went through Cultural Awareness training showed large increases in knowledge about Afghans, whereas Soldiers who went through SFT showed little or no increase. The Cultural Awareness training depicted the people of Afghanistan as highly diverse and largely illiterate, but people

whose families, principles and practices have cultural and historical bases. The goal of this information was to increase their understanding of the Afghan people and to increase perceptions of their being a warm and humane people. Analyses confirmed that Soldiers exposed to this training increased their perceptions of the warmth of Afghans relative to Americans (igog-wdiff) but not their competence relative to Americans (igog_cdiff). Moreover, and as would be expected, Soldiers in Platoon 7 did not affect these outcomes, consistent with the Social Fitness and Cultural Awareness training have specific social outcomes rather than producing general halo effects or biased responding by Soldiers.
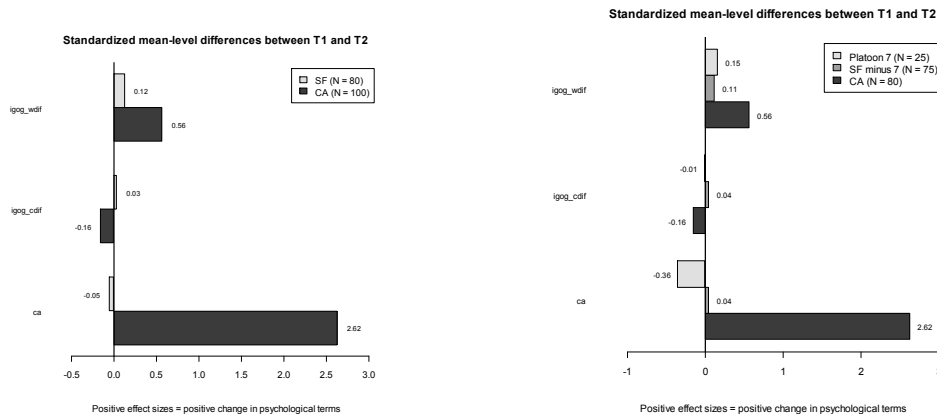
We also decomposed the effects depicted above to ensure the effects were attributable to changes in the perceptions of *Afghans*, not in the perceptions of Americans. These analyses are summarized below, where igog_usw = change in the perceived warmth of Americans, igog_usc = change in the perceived competence of Americans, igog_afw = change in the perceived warmth of Afghans, and igog_afc = change in the perceived competence of Afghans. The results confirmed that the Cultural Awareness training increased the feelings of warmth toward Afghans as a people.
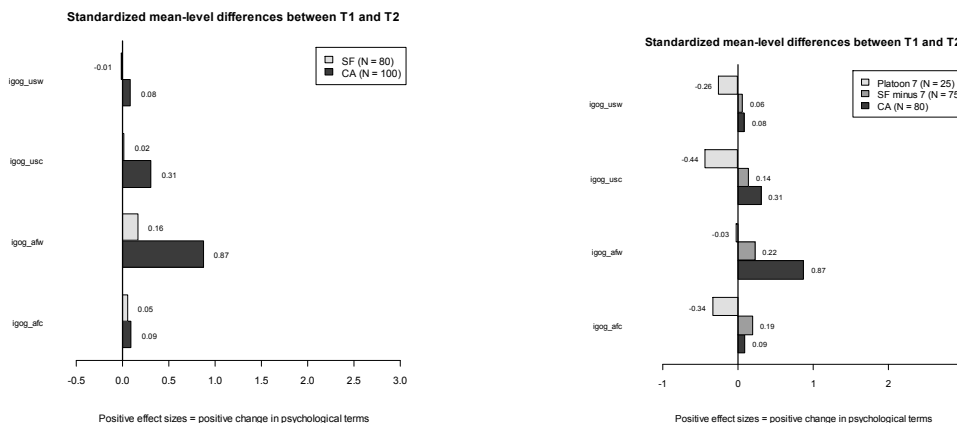
In sum, Social Fitness, relative to Cultural Awareness training had a sizeable effect on the social tools the Soldiers believed they had to interact more effectively with others, and small effects on how socially isolated the Soldiers felt by the end of training. Moreover, the effect sizes for the SFT were similar to those observed for MRT training and in public health interventions. In addition, the CAT, relative to SFT, produced increases in knowledge about Afghans and Afghanistan and increases in how warm the Afghan people were perceived. This double dissociative pattern of outcomes (SFT showing relative improvements on measures of social connection, Cultural Awareness training showing relative improvements on measures of social prejudice) rules out various artifactual interpretations such as Hawthorne effects, experimenter biases, or halo effects.

The Pilot Study at Fort Lewis provided evidence in terms of the magnitude and specificity of the training programs, and it revealed areas of improvement that can lead to better training and research. For instance, the CAT proved to be specific and effective in increasing the knowledge of the Soldiers about Afghanistan and in reducing outgroup hostility. The SFT, in contrast, proved to have specific but smaller effects (comparable to public health interventions), but it also became clear that some of the effects (e.g., on measures such as depressive symptomatology & squad cohesion) may require longer-term measurements.

The pilot study also raised the possibility that the SFT, in its current form, may be ineffective with platoons whose NCOs are antagonistic. The Chicago team performed a variety of additional analyses of the data and examined all notes and documentation to determine what might be responsible for this result. For instance, the version of SFT used at Fort Lewis made extensive use of "Sharing Stories." Following the pilot study at Fort Lewis we determined that this is not the most effective use of our training time, and several reasons were identified for replacing these with more practical exercises. First, listening to stories (regardless of whether they are about success or failure) represents passive learning for most of the Soldiers, whereas practical exercises engage all Soldiers in an active, collective learning activity. Second, the practical exercises can be led by the NCO(s) and therefore represent more ecologically valid training activities. Third, inappropriate or embarrassing disclosures by Soldiers can be damaging to the social fitness of the platoon and are avoided. Fourth, the practical exercises provide a greater sense of certainty because they are not contingent on getting "appropriate" stories from Soldiers. Fifth, shared stories can be highly variable in length and content, increasing variability across platoons and uncertainty within platoons. The practical exercises are more standardized and instill greater certainty within platoons, all of which are important if the training is to be implemented broadly in the Army. Finally, the requirements for the trainers are not as high because the training is more about content presentation and giving instructions for the exercises.

We revised the SFT to deemphasize the emotional component, and we worked with former NCOs to increase the relevance of the training to today's Army. In addition, the SFT was revised and implemented as a *training* program (like the CAT) rather than as what some Soldiers regarded as group therapy sessions. We presented a version of the new SFT to Dr. Adler, LTC McGurk, and LTC Thomas at WRAIR on 17 NOV 2011. Their feedback was invaluable and led to the SFT that we tested at Fort Sill in March, 2012. The plan, as outlined by COL Adler, LTC McGurk, and LTC Thomas of WRAIR and CPT Lester of CSF following our pilot study at Fort Lewis, was to pilot test the revised SFT using two platoons in a pre-test/posttest design at Fort Sill in March. CPT Lester took the lead on making the arrangements for this pilot test.

Fort Sill Pilot Study

The second pilot study to determine the efficacy of the SFT was implemented at Fort Sill at the level of the platoon, with each of two platoons participating in a one-hour pretest, eight hours of training, and a one hour posttest (2 hours/day, M-F). One platoon consisted of 25 Soldiers from an ADA BDE, and one consisted of 21 Soldiers from an Artillery BDE. Soldiers completed the same scales in the pretest and the posttest. These measures are summarized in Appendix A.

The average time to complete the surveys was approximately 11.28 minutes for the pretest and 14.27 minutes for the posttest. The installation network went down during the posttest, but the Techwerks staff quickly activated a WIFI cell-phone hub that permitted Soldiers to complete the survey. No data were lost or compromised, and the University of Chicago and TechWerks staff continued to work well as a team. 54 Soldiers completed the posttest: 46 (81%) of the 57 Soldiers who had completed the pretest and 8 additional Soldiers who were not available at pretest. Effect size calculations (posttest-pretest) are based on the Soldiers who completed both tests.

Soldiers in the platoons were tasked with going through the training, but Soldiers were asked to give their explicit consent to use their data for research. The rate of consent was an astonishing 100% at the pretest. This high consent rate possibly reflects the importance the Command Structure at Fort Sill placed on resilience training. To determine whether the responses provided by the Soldiers were valid, we searched for patterns that might reflect biased responses. For each scale and each individual Soldier, we examined whether (a) the same response option was selected for all items in that scale and (b) whether the responses followed sequences such as 1-2-3-4 or vice versa. The survey included some scales with reverse-coded items to detect any such response biases. No clear evidence was found for response biases in the pretest or posttest, and results were not changed substantively when we repeated the analyses deleting data that fell within a region of uncertainty regarding the operation of response biases.

We next examined the distributions of the variables to identify outliers. Assuming normally distributed variables, a small percentage of outliers is to be expected. An unexpectedly high number of outliers may indicate invalid responses. In this study, we first defined outliers as values that were at least 2.5 standard deviations (*SD*) below or above the mean of the respective scale. The number of outliers in the pretest and in

the posttest was within the range one would expect by chance. Because outliers can significantly bias the results of parametrical analyses, we replaced all extreme values (defined as values that were at least 3 standard deviations below or above the mean) with the value corresponding to 3 standard deviations below/above the mean on that particular item. This procedure ensures that outliers are not overweighted in the statistical analyses while still treating them as valid data.

Did SFT Motivate Soldiers to Practice the Skills They Were Taught? One goal of the social resilience training is to teach a series of skills. To assess the degree to which the Soldiers used these skills outside the training, we selected the two most important skills from each session, and Soldiers indicated how often they exhibited each of these 8 behaviors in the past work week.   Results showed that Soldiers showed such behaviors outside the training context as a result of SFT (see Figure below).

Standardized mean–level differences between T1 and T2

skill   0.33

Did SFT Increase the Social Tools Soldiers Possessed? Perceived Soldier Fitness was assessed to determine the extent to which SFT changed the Soldiers' confidence to perform various social fitness behaviors, and Beliefs about Social Fitness were assessed to determine the effects of SFT on their beliefs about the efficacy of social behaviors (see Appendix). Results indicated that both were improved by SFT, with mean effect sizes ranging from .41 to .50 (see Figure below).
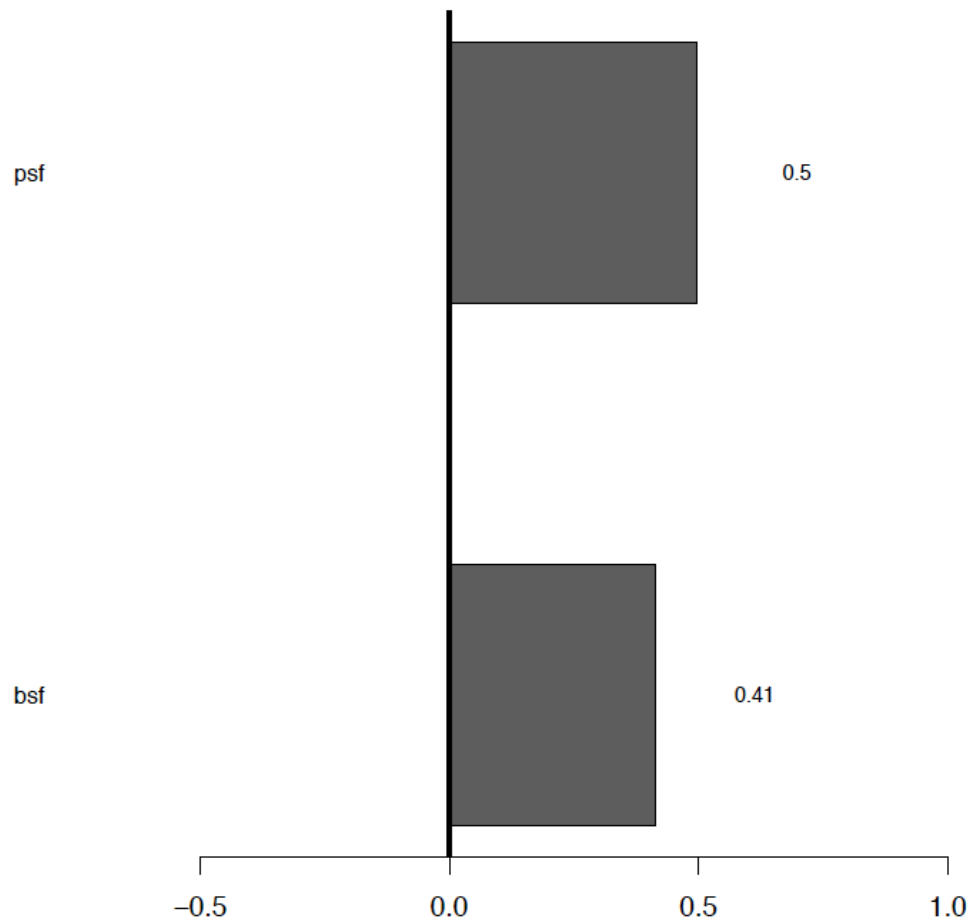
We next examined the extent to which SFT affected perspective taking and egocentrism. Results again proved encouraging. The effect size for training was +.24 for perspective taking and -.25 for egocentrism. The latter may initially seem counterintuitive but higher scores mean the training led Soldiers to want people to better understand why they do what they do (see Appendix). For instance, perspective taking and

Standardized mean–level differences between T1 and T2

psf   0.5

bsf   0.41

-0.5   0.0   0.5   1.0

egocentrism at the posttest was correlated +.41, indicating that those who were most likely to take the perspective of others were also more likely to seek to have others better understand themselves.

Did SFT Improve Feelings of Social Isolation and Satisfaction with Relationships in the Platoon? The analyses above indicated that Soldiers who went through SFT were using social skills covered in the training. We next sought to determine whether SFT improved feelings of social isolation and/or satisfaction with relationships in the platoon. Analyses of the UCLA loneliness scale, as well as the subscales of intimate, relational, and collective isolation, revealed substantive improvements as a function of training, with effect sizes ranging from .25 to .32 (see Figure below).

Standardized mean–level differences between T1 and T2

Measure	Effect size
ucla	0.32
ucla_i	0.31
ucla_r	0.23
ucla_c	0.25

Positive effect sizes = positive change in psychological terms
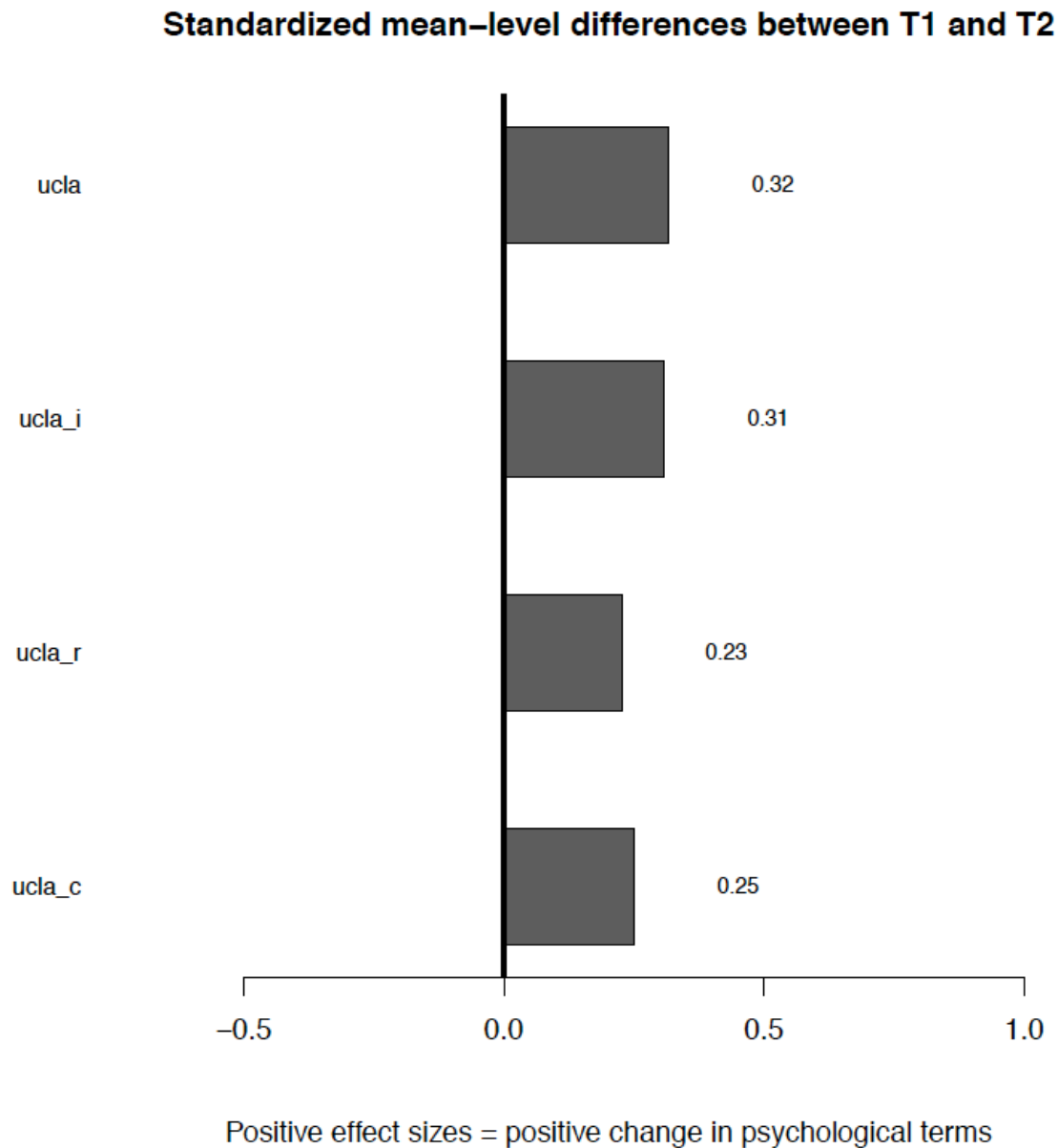
We also assessed the extent to which the training affected the Soldiers' extent to which they felt they knew others in the platoon (RSP1) and their satisfaction with their relationships with others in the platoon (RSP2). The results, which are summarized in the Figure below, indicated that both increased as a function of SFT.

Standardized mean–level differences between T1 and T2
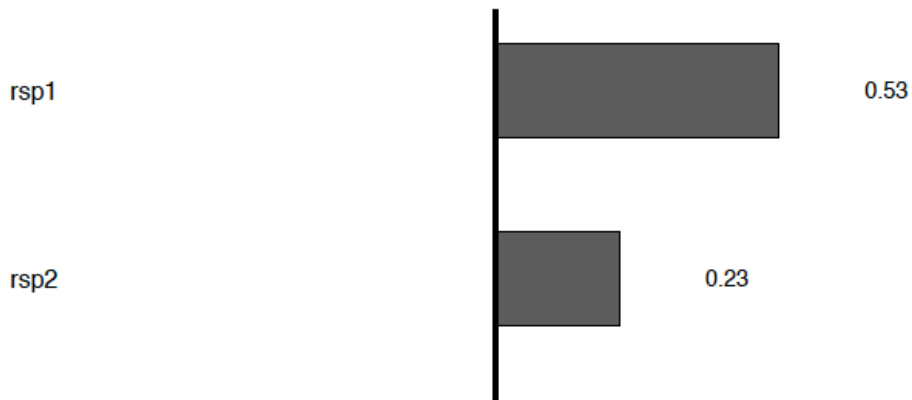
*Did SFT Improve the Collective Behaviors in the Platoon?* We measured three variables to determine the extent to which SFT improved productive behaviors in the platoons: Collective Platoon Efficacy (CPE), Counterproductive Work Behaviors (CWB-reverse scored), and Organizational Citizenship Behaviors (OCB). Descriptions of these measures are provided in the Appendix. Analyses indicated that SFT increased collective platoon efficacy and decreased counterproductive work behaviors (see the Figure below). Changes in Organizational Citizenship Behaviors unfold over longer periods of time, but the failure to find much effect of SFT on these behaviors suggests the Soldiers are responding honestly rather than simply showing a positive response bias on the scales they completed.
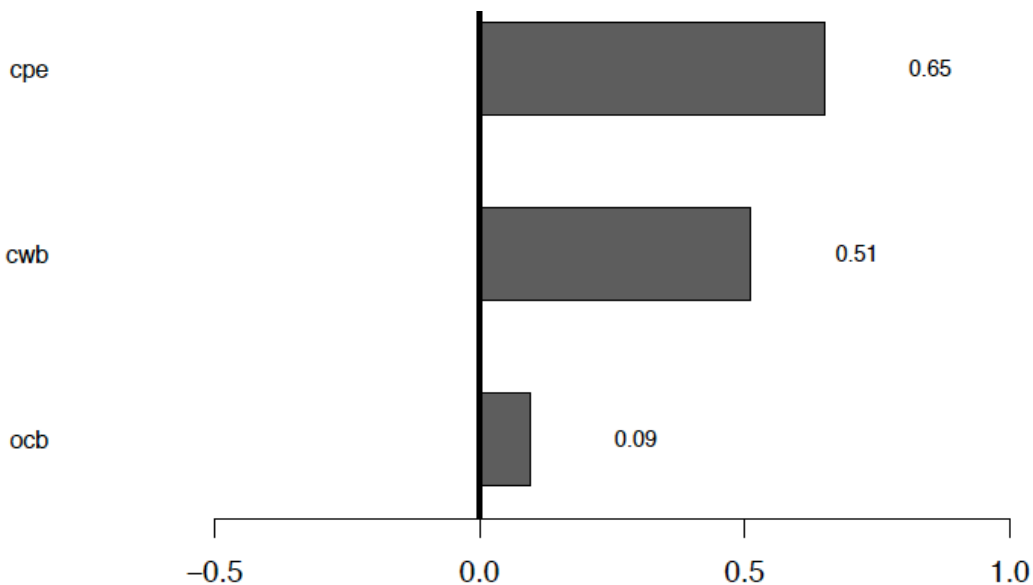
Positive effect sizes = positive change in psychological terms

Did SFT Improve Stress and Affective Well-Being? We first determined whether the mood of the Soldiers was affected by the training. Analyses indicated that SFT improved the affective well being (SPANE) of the Soldiers (see the Figure below).

spane   0.31
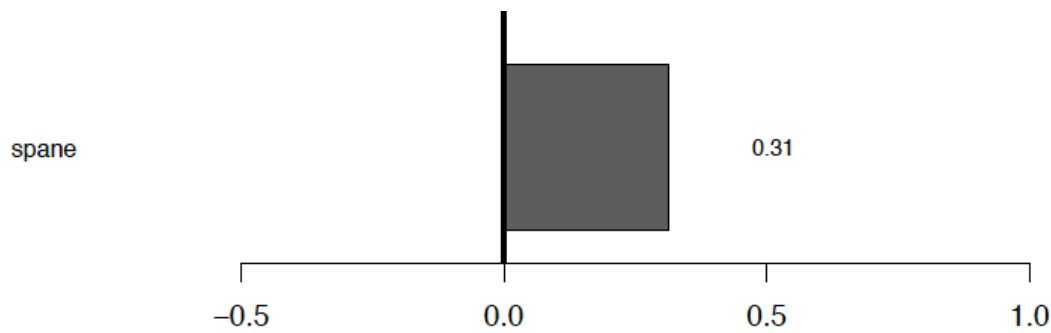
Positive effect sizes = positive change in psychological terms

We next examined the extent to which SFT influenced the perceived stress (PSS) or depressive symptomatology (PHQ) of the Soldiers. Changes in these indices are constrained by the period over which Soldiers report on their depressive symptoms, as it does not permit the effects of training to have much time to operate. Nevertheless, analyses summarized in the Figure to the right, indicated that SFT did have modest effects on perceived stress and depressive symptomatology.

Finally, analyses that examined the generalizability of the results were also encouraging. For instance, analyses revealed that the two platoons responded similarly to the treatment, though the effect sizes tended to be larger for Platoon 1 than Platoon 2. Analyses of individual trajectories grouped by rank (NCO or not) and analyses of individual trajectories grouped by high or low risk, as indexed by the GAT, also indicated there was individual variability but generally similar effects across rank and GAT risk categories.

Standardized mean−level differences between T1 and T2

pss   0.19

phq   0.24
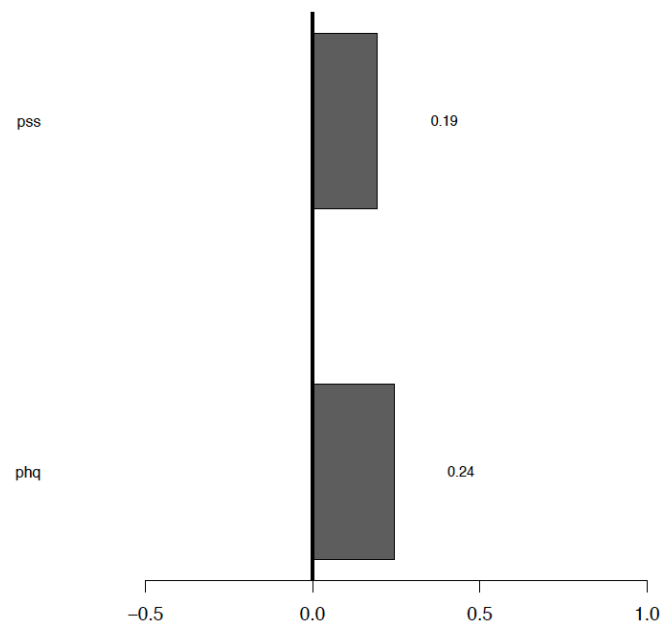
Positive effect sizes = positive change in psychological terms

Key Research Accomplishments

- Completed the development and piloting of Social Fitness Training that has a moderate effect size on improvements in social skills (e.g., perspective taking, constructive conflict resolution), perceived social isolation, relationship satisfaction within the platoon, collective platoon efficacy, and counterproductive work behaviors, but does not improve outgroup hostility.

- Completed the development and piloting of Cultural Awareness Training that has a moderate effect size on improvements in outgroup hostility but does not improve social skills, perceived social isolation, relationship satisfaction within the platoon, collective platoon efficacy, or counterproductive work behaviors.

- Established a secure, confidential, reliable, and fast "Soldier to Statistics" computer network, database, and statistical analysis system that ensures the research outcomes are evaluated objectively and accurately in accordance with best practices in data management and statistics.

Reportable Outcomes

The focus in Year 1 of this grant period was on staffing, development of the training materials, creation of databases and processes, and piloting of the training materials to determine their effect sizes. We are not

scheduled to produce write-ups for meetings or publications until we complete the training of the two brigades, at one or more sites and dates to be determined by FORSCOM, but we a created a "Soldier to Statistics" process in place, and the PI participated in an event for military veterans sponsored by the University of Chicago and the Chicago Lyric Opera (see Appendix B). In addition, the Cacioppo, Reis, and Zautra (2011) *American Psychologist* article on social resilience, which reflects work we have done with CSF in the Army in preparation for the SAAT, appeared as we were preparing for the start of this grant project (see Appendix C).

Conclusion

The results of Year 1 of SAAT permit us to move forward with an unchanged SOW. We have fallen behind the proposed timeline because we are not the highest priority in FORSCOM's tasking. (FORSCOM, not we, determine the sites and dates of the bases in which the research is being conducted.) However, we have taken this additional time to improve the SFT. We have also verified the improvements in SFT through the Fort Sill pilot study. We found that the revised SFT motivated the Soldiers to use the skills they were being taught, enhanced their scores on social fitness skills, improved their relationships with other Soldiers in the platoon, improved mood and stress levels of the Soldiers, decreased counterproductive work behaviors, and increased collective platoon efficacy (as indexed by moderate to large effect sizes on these outcomes).

We held two focus groups at the conclusion of the Fort Sill pilot study, at which time we heard a consensus that the Soldiers were appreciative for the training they had received. The extent to which Soldiers continue to practice these skills to maintain and improve platoon Social Fitness remains to be seen, but the analyses of the data obtained from the Soldiers at Fort Sill suggests that the training provides a foundation on which leaders and Soldiers can build. The clinical trials with the Brigades involves long-term follow-up assessments to determine the extent to which: (i) the Soldiers and platoons practiced the skills they were taught in SFT, and (ii) the training led to better outcomes for the Soldiers during and following deployment. The results we found in our analyses of the Fort Sill pilot data and the feedback we received from these focus groups have also highlighted further improvements we can make in the SFT. We are undertaking these revisions and providing additional training to the former NCOs who will be overseeing the trainers when we train the two brigades so that the SFT is as efficacious as we can make it for the Soldiers.

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Appendix A

Pretest and Posttest Measures at Fort Sill

Perceived social isolation. The R-UCLA Loneliness Scale is a well-validated measure of overall perceptions of isolation (and its opposite, perceived social connectedness) and degree of satisfaction with one's social network (Russell, Peplau, & Cutrona, 1980; Russell, 1996) that avoids explicit reference to terms such as "lonely" and "loneliness." Factor analysis of this scale has revealed three related dimensions, Intimate, Relational, and Collective Connectedness, that exhibit discriminant validity as revealed by their unique associations with being married, having a larger number of close friends, and belonging to more voluntary groups, respectively (Hawkley, Browne, & Cacioppo, 2005). We used a 9-item short version of the R-UCLA consisting of those items with the highest factor loadings on each of these dimensions. Examples of the items are "How often do you feel left out," "How often do you feel close to people," and "How often do you feel part of a group of friends." Each of the items is rated on a scale with response options 1 (*never*), 2 (*rarely*), 3 (*sometimes*), and 4 (*often*). After reverse scoring appropriate items, perceived isolation scores are calculated by summing all items. The range of possible scores is 9 to 36, with higher scores signifying greater perceived isolation and, conversely, lower scores signifying greater perceived social connectedness.

Satisfaction with relationships in the platoon. Relationships in the platoon will be assessed with 2 items: "On average, how well do you know the people in your platoon?" and "On average, how satisfied are you with your relationships with people in your platoon?" The response is given on a 5-point scale from 1 (*not at all*) to 5 (*very much*).

Perspective Taking. Perspective taking is assessed with four items from the perspective taking subscale of the Interpersonal Reactivity Index developed by Davis (1980). The responses are given on a 5-point scale ranging from 1 (*do not agree at all*) to 5 (*agree completely*). and averaged to form a total perspective taking score that ranges from 1 (low perspective taking abilities) to 5 (high perspective taking abilities).

Perceived Social Fitness. Perceived social fitness refers to the confidence people have to be able to perform various social fitness behaviors. The scale consists of 15 social fitness skills that were adapted from the UCLA-R scale, the Social Intelligence Scale (Silvera, Martinussen, & Dahl, 2001), and the Perceived Social Self-Efficacy Scale (Smith & Betz, 2000). Example items are "Use my social skills and abilities for the benefit of the platoon" and "Understand what others really mean through their expressions, body language, etc.". Responses were given on a 5-point scale from 1 (no confidence at all) to 5 (complete confidence). Responses were averaged to yield a total score that ranged from 1 (low perceived social fitness) to 5 (high perceived social fitness).

Beliefs about Social Fitness. Beliefs about social fitness are assessed with three items: "I believe that social skills can be improved through practice," "I believe that it is important for a platoon to have a common identity," and "I believe that it is right for a platoon to socially reject its poorly performing members (reverse coded)." Responses are given on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and are reversed if appropriate and averaged to form a total belief score ranging from 1 (non-adaptive beliefs) to 5 (adaptive beliefs).

Egocentrism. Egocentrism is assessed with three items from the Egocentrism Scale by Enright, Shukla, and Lapsley (1980). The Soldiers rate the extent to which the statements are important to them personally. An example item is "Getting other people to better understand why I do things the way I do." Responses are given on a 5-point scale ranging from 1 (no importance) to 5 (great importance) and are averaged to form a total egocentrism score.

Showing social skills. One goal of the social resilience training is to teach a series of skills. To assess the degree to which the Soldiers use these skills outside the training, we selected the two most important skills from each session. The Soldiers are asked to indicate how often they have shown these 8 behaviors in the past work week by selecting one of the following response options: 0 (*never)*, 1 (*once)*, 2 (*2-3 times)*, 3 (*4 times or more)*. A sample item is "Take another person's perspective" and". The responses are summed to form a total score that ranges from 0 (never showed any of these behaviors) to 24 (showed all of these behaviors frequently).

Satisfaction with training. Satisfaction with the training is assessed using the item "Overall, how satisfied are you with the SAAT training?" Responses are given on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*).

Perceived Stress. The Perceived Stress Scale (PSS) is a 10-item self-report questionnaire that has demonstrated good internal consistency and validity (Cohen, Kamarck, & Mermelstein, 1983). For economy reasons, we used a shorter 4-item version. The PSS asks respondents to indicate how often they felt or thought a certain way during a specified time period (i.e., over the last two weeks). Examples of items include, "how often have you felt that you were unable to control the important things in your life," and "how often have you felt that things were going your way." Responses to each item use a 5-point Likert-type scale that ranges from 0 (*never*) to 4 (*very often*). After reverse scoring appropriate items, scale scores are calculated by summing the responses to all items, yielding a score range of 0 (low perceived stress) to 16 (high perceived stress). Perceived stress has been associated with substance use in military men and women (Bray, Fairbank, & Marsden, 1999), whereas the ability to perceive events in less threatening ways enhances resilience (Feder, Nestler, & Charney, 2009).

Affective well-being. Affective well-being is assessed with four items from the Scale for Positive and Negative Experiences (SPANE; Diener et al., 2010). The Soldiers rate how often they experienced feelings like "pleasant" or "bad" in the past work week on a scale ranging from 1 (*very rarely or never*) to 5 (*very often or always*). The responses are reverse-coded if appropriate and averaged to form a total affective well-being score that ranges from 1 (low affective well-being) to 5 (high affective well-being). An important difference between the PANAS and the SPANE is that the former refers to specific emotions whereas the latter refers to more general affective states. A validation study has shown that these scales are empirically distinct (Diener et al., 2010).

Collective platoon efficacy. Collective efficacy refers to people's shared beliefs in their collective capacity to achieve desired outcomes (Bandura, 2006). The collective efficacy of the platoon will be assessed by adapting 5 items from the family efficacy scale (Bandura, 2006) for administration to soldiers about their platoon. Soldiers will be asked to rate how confident they are that their platoon, working together as a whole, can, for example, "resolve conflicts among platoon members," and "support each other in times of stress." Furthermore, the item "develop a strong identity" was added. The response scale ranges from 1 (not at all confident) to 5 (highly confident). Responses are summed to create a total collective efficacy score that ranges from 6 (low collective platoon efficacy) to 30 (high collective platoon efficacy). Members' appraisals of their platoon's abilities will be aggregated within platoons to measure perceived collective platoon efficacy.

Organizational Citizenship Behaviors. Organizational citizenship behaviors (OCBs) are discretionary behaviors that are not directly or explicitly recognized by leadership but that enhance the effectiveness and efficiency of teams and organizations. OCBs entail behaviors from different domains, including altruism, courtesy, conscientiousness, sportsmanship, and civic virtue (Podsakoff, MacKenzie, Moorman, & Fetter, 1990). For this study, we adapted five items from the military version (Deluga, 1995) of the 24-item OCB scale by Podsakoff et al. (1990). For each of the above five mentioned domains, one item was selected based on factor loading and face validity. Sample items are, "Members of my platoon obey rules and regulations even when no one is watching," and "Members of my unit perform duties that are not mandatory, but are considered important." Items are rated on a 4-point scale from 1 (*very unlikely*) to 4 (*very likely*). Responses are reversed if appropriate and summed to create a total score on OCBs. Ehrhart et al. (Ehrhart, Bliese, & Thomas, 2006) found that helping behaviors exhibited substantial within-group agreement ($r = .87$), and differed fairly reliably between groups (ICC(2) = .69). Unit-level helping behavior was related to unit effectiveness (unit-level physical fitness, award rate, M16 marksmanship) beyond what was explained by unit cohesion, unit conflict, and leadership effectiveness (Ehrhart et al., 2006).

Counterproductive Work Behaviors. Counterproductive work behaviors (CWBs) are discretionary behaviors that harm or intend to harm the effectiveness and functioning of an organization. CWBs will be assessed at the platoon-level with a 6-item scale used by Dalal et al. (2009) that asks, for example, how likely it is that platoon members "behave in an unpleasant member toward other platoon members," and "speak poorly about other platoon members." Items are rated on a 4-point scale from 1 (*very unlikely*) to 4 (*very likely*). Dalal et al. (2009)

found that helping behaviors and counterproductive behaviors were independent of each other and each explained unique variance in job performance.

Depressive Symptoms. The PHQ-9 is the 9-item depression scale of the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999). It is a reliable self-report measure of depressive symptoms and depression severity (Kroenke, Spitzer, & Williams, 2001) that has diagnostic validity (Spitzer et al., 1999). The PHQ-9 is based directly on the diagnostic criteria for major depressive disorder in the Diagnostic and Statistical Manual Fourth Edition (DSM-IV). Regarding experiences "over the last 2 weeks," respondents are asked to rate how often they have been bothered by problems such as, "little interest or pleasure in doing things," "feeling down, depressed, or hopeless," and "thoughts that you would be better off dead, or of hurting yourself in some way." Items are rated on a scale of 0 (*not at all*), 1 (*several days*), 2 (*more than half the days*), and 3 (*nearly every day*). Responses are summed to create a total score. Severity is determined categorically, where a score of 1-4 is minimal depression, 5-9 is mild depression, 10-14 is moderate depression, 15-19 is moderately severe depression, and 20-27 is severe depression. This scale was supplemented by the following item: "If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?" This item was rated on a scale from 1 (not at all difficult) to 4 (extremely difficult).

Appendix B

Director's Notes from the Chicago Lyric Opera Program

HERCULES

HANDEL

LYRIC OPERA OF CHICAGO

2010 | 2011

We are performing an edition of Hercules, *adapted from three acts to two, that shapes the piece with a view to bringing Handel's oratorio closer to Sophocles's original play,* The Women of Trachis. *The production is part of a collaboration between Lyric Opera, The University of Chicago, and organizations supporting Veterans, such as the McCormick Foundation and A Safe Haven Foundation. Some of the questions we are grappling with are touched upon in the following reflections on the play by John T. Cacioppo, Distinguished Service Professor and Director of the Center for Cognitive and Social Neuroscience at The University of Chicago.*

— Peter Sellars

There are hidden costs in war.

First, soldiers at war are exposed to atrocities that belie the soothing myths that people are benevolent and the world is "just." By dehumanizing the enemy, it becomes simpler to maim and kill other humans, but who precisely is the enemy that is worthy of such a fate can be difficult to discern. Why should the soldier not use the same means to an end if that end is a better existence for their personal group?

Soldiers may wish to return to their families and friends the same person as before they departed, but fundamental aspects of who they were can be among the casualties of war. Ironically, it is the victors and their families who may be at greatest risk for this dissonance because they carry with them the material accoutrements of victory. Yet learning viscerally of the inhumanity they are capable of committing, and to which they can be subjected, strips away forever the last innocence of childhood. With such developments also comes a loss of psychological buffers from the stressors and trauma of warfare, including their anxi-

eties and fears of death and crippling injuries, grief over the loss of friends, guilt over surviving when those around them who were just as able did not, and their own transformative pain and injury. Memories of these events change these soldiers and can haunt them at the most inexplicable moments day and night. It can leave soldiers feeling isolated and damaged at best and broken beyond repair and unworthy of love at worst.

Contemporary research has documented the costs of these conditions. Among these costs are suicide, alcohol and substance abuse, posttraumatic stress disorder (PTSD), divorce, mental-health issues, domestic abuse, sexual assault, weight gain, low re-enlistment rates, and attrition of future leaders. For instance, Thomas, Wilk, Riviere, McGurk, Castro, and Hoge (2010) found rates of PTSD and depression after returning from combat in Iraq ranged from 9% - 31%. Situational and dispositional factors play a role in these adverse outcomes. The existing research indicates that prior emotional disturbances increase stress vulnerability (e.g. King, King, Foy, & Gudanowski, 1996), and this effect has been replicated in military personnel (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007). Similarly, Hoge, Auchterlonie, and Milliken (2006) found exposure to combat was related to post-deployment mental health problems, mental health care referral and utilization, and attrition from military service. Seal, Bertenthal, Miner, Sen, and Marmar (2007) reported that 25% of the veterans of Operations Enduring Freedom and Iraqi Freedom seen at VA healthcare facilities received mental health diagnoses, with the youngest group (age 18-24 years) at greatest risk for receiving mental health or PTSD diagnoses.

If victorious soldiers are non-obvious victims of war, then the family and

friends who are left behind during wartime are the invisible victims. As such, they represent the second hidden cost of war.

Families and friends are tied through invisible bonds to the soldiers. These invisible bonds are both wonderful and insidious. They are wonderful because it is these feelings and commitments that make humans capable of such altruism, cooperation, and achievements. They are insidious because they pull family and friends, blind, defenseless, and unknowingly, to the center of an imaginary battlefield where loved ones are subjected to unimaginable horrors. These family and friends, then, are also changed forever, and many are guilt-ridden by thoughts or acts of disloyalty as they (understandably) seek the comfort of more visible, secure feelings of connections or of chemical surrogates for these feelings. Having lived vicariously through attacks on loved ones they could neither see nor defend, these families and friends may find it difficult to relate to their beloved soldier when s/he returns home because each misunderstands what specifically the other has endured and how profoundly each has been changed. Sophocles's Dejanira is a tragic case in point.

A third hidden cost derives from the fact that, because we are fundamentally connected to one another in myriad, invisible ways, the revenge of a vanquished warrior can extend beyond the grave. The centaur Nessus was able to slay Hercules from the grave through the hands of Dejanira, who sought only to be his sole lover. Dejanira's own suicide reflects an effect of her connection to Hercules that extended beyond his life.

Appendix C

Cacioppo, J. T., Reis, H. T., & Zautra, A. J. (2011). Social resilience: The value of social fitness with an application to the military. *American Psychologist*, *66,* 43-51. doi: 10.1037/a0021419

Social Resilience

The Value of Social Fitness With an Application to the Military

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Resilience has been regarded narrowly as a quintessential individual property by most investigators. Social resilience, however, is inherently a multilevel construct, revealed by capacities of individuals, but also groups, to foster, engage in, and sustain positive social relationships and to endure and recover from stressors and social isolation. Emergent levels of organization, ranging from dyads, families, and groups to cities, civilizations, and international alliances have long been apparent in human existence, but identifying the features of individuals, relationships, and group structures and norms that promote social resilience—and determining effective interventions to build social resilience—represent some of the most important challenges facing the military as well as contemporary behavioral science. We identify nine personal resources that foster social resilience, and we describe an educational, computer-based program that builds on these resources in an effort to improve the social resilience among troops in the U.S. Army. Data from this program should provide valuable evidence regarding the challenge of building social resilience.

Keywords: resilience, social resilience, military, group processes, cooperation

In our Scripture, it is written that when you do not have hope, you look for it in the face of your friend.
—Gazan man quoted by Gordon (2009)

On January 3, 1864, the *Grafton*, an English schooner piloted by Captain Thomas Musgrave, was struck by a hurricane that broke its anchor chains and sunk it on the rocky beach on the southern end of Auckland Island. The captain and his crew of four men made it to shore but not to safety. Auckland Island is one of the most inhospitable places on earth, with freezing rain, howling winds, and little to eat year round.

On May 10th of the same year, the *Invercauld*, an Aberdeen clipper piloted by Captain George Dalgarno, was struck by a heavy gale and driven between two steep cliffs on the northern side of Auckland Island and sunk. Nineteen of the twenty five men aboard the *Invercauld* made it ashore, unaware of the existence of the other crew despite their spending more than a year together on the desolate and inhospitable island.

The survivors of the *Grafton* abandoned formalities from the past and adopted group problem solving and decision making, whereas the survivors of the *Invercauld* retained the formal hierarchy that served them so well on the high seas. Although the challenges to survive were quite similar, the outcomes for these two crews could not have been more different. The crew of the *Grafton* worked together to find food and water, consulted with and looked after one another, constructed shelter, and contributed to their rescue by building a vessel and setting out to sea where they were found by Captain Cross of the *Flying Scud*. The crew of the *Invercauld*, on the other hand, fought and splintered, lost 16 of the 19 to cold or hunger, descended into cannibalism, and was found only by chance. The *Julian*, a Peruvian ship, had sprung a leak off the island and set a boat ashore to seek assistance. There they found and rescued the three remaining crew members of the *Invercauld* (Druett, 2007).[1]

We may aspire to be self-sufficient and celebrate our individual achievements, but our remarkable accomplishments as a species are attributable to our collective action, not our individual might. Human evolutionary heritage has endowed us with the capacity to feel the pain of social isolation and the rewards of social connection. Importantly, it has also endowed us with the capacity to feel others' social pain and the compassion to care for the sick and the elderly far beyond their reproductive or instrumental utility. Social species generally do not fare well when forced to live solitary lives, and we are certainly no exception. Humans, born to the longest period of utter dependency of any species and dependent on conspecifics across the life span to survive and prosper (Cacioppo & Patrick, 2008; Hartup & Stevens, 1997), do not fare well when living solitary lives or when it simply feels that way. Social isolation is associated not only with lower subjective well-being (Berscheid, 1985; Burt, 1986; Myers & Diener, 1995) but

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[1] We thank William Patrick for suggesting this example of social resilience.

John T. Cacioppo

with broad-based morbidity and mortality (Cacioppo & Hawkley, 2009; House, Landis, & Umberson, 1988).

Humans are a social species, and by definition social species create emergent structures that extend beyond the individual. Whales swim in pods, wolves hunt in packs, penguins share warmth in huddles, fish swim in schools, and birds migrate in flocks. The emergent social structures created by humans are more abstract, flexible, and variable than those in other species. These structures range from dyads and families to nations, international alliances, and virtual global communities. Whereas genetic similarity likely has an impact on the behavior of all social species, ideological similarity (e.g., brothers in arms, an army of one) has a uniquely powerful impact on the behavior of our species. These emergent organizations are not all created equal, however, and differences in the properties of these superorganismal structures are only partly a function of the characteristics of the individuals who constitute these structures. The captains and crews of the *Grafton* and the *Invercauld* developed different governance structures and group norms when confronted with conditions that to solitary individuals meant likely death. The captain and crew of the *Grafton* eliminated the formal hierarchy and norms that functioned well at sea in favor of group consultation and cohesion in the face of these new and dire challenges. They instead created a culture in which everyone's survival was tied to the survival of one another. These norms encouraged individuals to work for the good of the group rather than for themselves at the expense of the group because they believed their contributions would be repaid in kind, a social rule promoting cooperation and effective collective action: what Bowles (2006) termed *network reciprocity*. The captain and crew of the *Invercauld*, in contrast, maintained the hierarchical structure and privileges that existed at sea even though the challenges faced on the island demanded a more flexible authority structure. The behaviors of the crew were guided by individual self-interests rather than group interests, which resulted in a high rate of mortality. In short, the social structures of these two groups differed in their resilience, leading to survival and rescue for one crew and disastrous outcomes for the other.

What Is Social Resilience?

Social resilience is the capacity to foster, engage in, and sustain positive relationships and to endure and recover from life stressors and social isolation. Its unique signature is the transformation of adversity into personal, relational, and collective growth through strengthening existing social engagements, and developing new relationships, with creative collective actions. As noted in the companion articles in this issue, individual resilience emphasizes an individual's capacity to find opportunities in tragedy and to turn adversity to advantage. *Social* resilience emphasizes an individual's capacity to work with others to achieve these endpoints and, consequently, the group's capacity to do so as well. Social resilience, unlike other forms of personal resilience, therefore is intrinsically multilevel and includes an individual's (a) characteristic ways of relating (e.g., agreeableness, trustworthiness, fairness; compassion, humility, generosity, openness); (b) interpersonal resources and capacities (e.g., sharing, attentive listening, perceiving others accurately and empathically, communicating care and respect for others, responsiveness to the needs of others, compassion for and forgiveness of others); and (c) collective resources and capacities (e.g., group identity, centrality, cohesiveness, tolerance, openness, rules for governance).

Social resilience also modulates the development and expression of individual resilience. For instance, social resilience leads to growth through enhancing relationships, meaning-making, social engagement, and coordinated social responses to challenging situations. Of course, other forms of resilience—for example, emotional or spiritual resilience—may also strengthen and preserve, but social resilience emphasizes the role of connections with other individuals, groups, and large collectives as a means of fostering adaptation through new learning and growth. Importantly, social resilience does not imply monolithic pressures toward uniformity nor an uncritically rosy view of the joys of relating. Both fair competition and cooperation, for instance, can contribute to resilience. What is unique about social resilience is an appreciation for the key contributions to human welfare of coordinated social activity and feelings of connectedness and "we-ness." In other words, when people work together toward their common benefit, taking into account their differences and seeking to profit from them while recognizing and valuing the bonds that link them to each other, their collective outcomes typically transcend those that would be obtained from more solitary activities and promote the development and expression of individual resilience.

Harry T. Reis

The significance of social groups in the design of human societies is highlighted by multilevel selection theory (Wilson, Van Vugt, & O'Gorman, 2008). This theory proposes that "early human evolution represented a major transition, turning our ancestral groups into the primate equivalent of bodies or beehives" in which well-functioning social groups had significant adaptive advantages over "mere individuals and less coordinated groups" (Wilson et al., 2008, p. 7). Attributes such as the empathic response (DeWaal, 2009), which enhanced participation and coordination in social groups, thereby became part of the human genome. Consistent with this thesis, extensive evidence demonstrates that relationships exert pervasive influences on human behavior and development throughout life (Reis, Collins, & Berscheid, 2000). The same may be said of groups and collectives.

Social resilience applies to nearly all forms of human association, from dyads of all types, to families, small groups, neighborhoods, communities, and cultures. Although social resilience is most commonly studied in the context of smaller units (e.g., dyadic relationships within families), the construct is intended to apply across all of the interpersonal groupings that are relevant to responding effectively to contemporary challenges and opportunities. For example, when Sarason (1974) wrote of the "sense of community," he defined a type of social relationship characterized by weak ties among persons held together by mutual purpose and a shared social identity. From relationships with co-workers to mechanics to neighbors, these weak ties serve a variety of important social functions (Blau & Fingerman, 2009). With urbanization, globalization, and modern technology, large-scale social groups and institutions affect individual well-being as never before, but the human need to have confidants and to connect with

other individuals remains important for personal resilience (Cacioppo & Patrick, 2008) and for the resilience of the group (Cacioppo, Fowler, & Christakis, 2009).

How Does Social Resilience Operate?

Given the centrality of social relations to human evolution, it is perhaps not surprising that the social situations people face in everyday life are complex and multifaceted (Bugental, 2000; Kelley et al., 2003). As a consequence, numerous specific attributes may serve as resources that facilitate social resilience. Although a detailed delineation is beyond the scope of this article, it is instructive to consider several broad constructs that appear repeatedly in studies of social resilience. A selective list is shown and defined in Table 1. Each construct represents an attribute measurable as a property of individuals but founded, furthered, and sustained by past and present social relationships that foster resilience-enhancing behavior. Thus, when we inquire of the social fitness of individuals, we also are asking about the structure of that person's social life: Each personal attribute is nested within relationships or groups in the sense that interaction with others elicits and supports the expression of that attribute.

Consider the capacity and motivation to perceive others accurately and empathically. One's ability to see others from the same lens with which one views oneself, and to respond supportively to them, is a cornerstone of social relations. To be socially resilient, one needs to understand how other persons perceive the diverse experiences and situations of life, because successful coordination of activity requires shared perspectives and coordinated goals. Also, heightened awareness of and concern for the needs of another person promotes positive interpersonal bonds. Of course, there are numerous other personal resources beyond those listed in Table 1 that advance social resilience.

Although many resilience-enhancing qualities reside within individuals, it is valuable to recognize that they are effective primarily when mutual and reciprocal, and when social tasks and situations encourage their expression. Resilience resources contribute to social resilience in a manner that is both interactive and iterative—in other words, they are constructive because one interacting partner's display of resilient behaviors fosters complementary behaviors by interacting others, and this process then unfolds repeatedly through ongoing interaction. Thus, ongoing virtuous cycles of resilient behaviors enhance problem solving and the maintenance and growth of relationships and groups, whereas downward spirals of nonresilient behavior lead to poor problem resolution and the deterioration of relationships and groups.

Social resilience depends on more than the personal attributes of interacting persons. The architecture of social situations is also important, as the history of social psychological research makes plainly evident (e.g., Janis, 1972). Situations can be structured in ways that encourage or inhibit the emergence of resilience-fostering thoughts, feelings, and behaviors. For example, the cooperative governance structure of the *Grafton* made it possible for prosocial emotions and behavior to emerge, fostering trust and

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collaborative problem solving and increasing the frequency of interactions that promoted acceptance and bonding among the survivors. Self-serving or antisocial behaviors, when and if they occurred, would be extinguished. In contrast, the rigid hierarchy of the *Invercauld* discouraged prosocial behavior, inhibited empathy, caring, and shared problem-solving, and made it unlikely that a sense of "we-ness" would emerge. Social resilience, therefore, is a *multilevel construct* because it represents a feature of groups as well as a feature of the individuals in the group.

Building Social Resilience

Embarking on programs to enhance social resilience means departing from the usual ways of thinking about the problems of people in three fundamental ways. First, the term itself emphasizes strengths that encourage patterns of positive adaptation rather than sources of vulnerability that place people at risk (Masten & Wright, 2009). In this way, resilience research shares some of the features of positive psychology (Seligman, Steen, Park, & Peterson, 2005) but without the risk of overattention to the positive when put into practice. Second, stressful experiences are inherently tied to the formulation, so that interventions to promote resilience need to be designed with specific sources of adversity in mind and with attention to the nonlinear dynamics of coping with and adaptation to that adversity (Zautra, Hall, & Murray, 2008). Third, the "social" in social resilience widens the angle of the researcher's lens from a focus on individual capacities to the examination of ways to build more adaptive social ecologies for people, groups, organizations, and communities.

As we have noted, this reorientation to the social systems that underlie individual fitness is by necessity multilevel and calls for interventions that extend the met-

aphor of personal fitness to adaptive relationships among peoples and the governance of groups. Indeed, one of the outstanding features of resilience is that it can be thought of as a systemic process (or processes) inherent in virtually any type of organized entity, from a simple biological system to a person, an organization, a neighborhood, a community, a city, a state, or even a nation (Zautra & Reich, 2011). In essence, social resilience represents a paradigmatic shift in our ways of thinking about people and their problems and thus requires a fresh look at the design of interventions to promote the kinds of qualities that increase the likelihood of resilient outcomes.

How might one apply these ideas in an intervention program? We use the idea of trust to illustrate how this might be done generally (see Table 2). We then address specifically how social resilience has been implemented thus far in the U.S. Army's Comprehensive Soldier Fitness program.

At the level of neurophysiology, researchers target oxytocin and various mechanisms of social reward such as dopamine and endorphin receptor densities, and they may inspect the size and integrative signaling of the anterior insula and cingulate, the amygdala, and prefrontal cortex (e.g, Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Uvnäs-Moberg, Arn, & Magnusson, 2005). Clinicians may inquire of the capacities of these neural systems to deliver signaling that provides for the foundation for social relatedness, and empathy, and may review pharmaceutical alternatives to treat deficiencies. These approaches have value, but alone, they miss the broader vision needed to advance social resilience. Personality assessments would focus on attention to socioemotional intelligence attributes such as self–other awareness and perspective taking and also attributes of secure attachment such as empathy, generosity, social connection, and intimacy, as shown in Table 1 (Simpson, 2007). Therapeutic and other instructional forms of intervention such as life coaching (Hart, Blattner, & Leipsic, 2001) and seminars could advance individuals' capacities for trust, but again, these approaches do not directly attend to the relationships themselves that give rise to trust and distrust.

Small units, whether in combat, in the office, or at home, represent social entities with system dynamics that may encourage or discourage trust among their members. Acceptance of diversity, mutuality, sharing of resources, commitment, and generativity are some of the attributes of small groups with a high trust quotient. A social network analysis of these small groups provides the basis for an understanding of communication gaps and sources of misunderstanding but also the unique strengths of strong ties within groups that can facilitate the growth of social fitness (Reis et al., 2000). Processes and patterns of relationship are the focus, with attention to the positive as well as the problematic in the assessment and advocacy for growth and advancement. For example, "forgiveness" methods have been advocated for use with families to aid recovery and release constraints on the positive feelings that family members with a history of troubled relations still may have

Table 1
Nine Personal Resources That Foster Social Resilience

Resource	Definition
Capacity and motivation to perceive others accurately and empathically	To be socially resilient, one needs to understand the diverse experiences and perceptions of other persons from their perspective and to supportively engage those understandings in a way that promotes bonding and coordinated activity.
Feeling connected to other individuals and collectives	Acceptance by stable, positively valenced relationships and groups fosters well-being, whereas social exclusion, or ostracism, has deleterious effects on health and well-being.
Communicating caring and respect to others	Acceptance is communicated to others by responsive acts that signal concern for their well-being and understanding and validation of them as individuals. Because reciprocity norms are ubiquitous in social life, communicating concern and respect for others is likely to foster responsive behavior on their part.
Perceiving others' regard for the self	Recognizing (or slightly overestimating) others' regard for the self promotes connections with others. Underestimates of one's standing in the eyes of others—as is typically the case for chronically lonely, shy, socially anxious, low-self-esteem, or anxiously attached individuals—often leads to defensively self-protective behaviors that can create further distance from others.
Values that promote the welfare of self and others	Values such as benevolence (concern for others with whom one has frequent contact) and universalism (concern for humanity) facilitate prosocial cognition, motivation, and action, such as altruism, tolerance, cooperation, empathy, and trust. These values complement rather than contradict healthy self-interest.
Ability to respond appropriately and contingently to social problems	Socially resilient persons recognize that many problems are inherently social: Such problems require appreciation of the nature of one's interdependent situation, and their solution depends on successful coordination of information and action between self and others. Thus, socially resilient persons promote constructive, team-oriented problem-solving strategies while avoiding individually focused strategies and social pressures that stifle open communication.
Expressing social emotions appropriately and effectively	Social resilience allows people to express social emotions such as gratitude, compassion, jealousy, and loneliness in constructive ways. It also promotes appropriate responses to others' displays of social emotions, through such responses as sympathy, forgiveness, and respect.
Trust	Trust refers to the belief that others can be relied upon and to the willingness to act on the assumption of the other's benevolence. When people trust, they may open themselves to potential exploitation, but more important, they signal their constructive intent to others, thereby inviting cooperation and mutually beneficial actions. Socially resilient people are neither insufficiently nor uncritically trusting; rather, their trust tends to be situationally contingent (which includes prior experience with the same persons).
Tolerance and openness	Socially resilient individuals value diverse perspectives and recognize that many tasks require coordination among persons with differing backgrounds, values, and priorities. Social resilience implies not merely acceptance of diversity but the intention to incorporate diverse perspectives into group activity. Nonresilient persons seek to eliminate diversity by excluding individuals who differ or by accentuating pressures toward uniformity.

toward one another (e.g., McCullough, Pargament, & Thoresen, 2000).

Large units, such as neighborhoods, communities, and combat battalions in the armed forces, defined both by place and mutual interests provide yet another level for assessment and possible intervention to further social fitness. Here, the focus is on furthering the expansion of social capital and strengthening connectivity by the reorganization of social exchange (Kretzmann & McKnight, 1993) and the development of a shared social identity that marks others as ingroup members. Relevant to trust at this level are concepts such as strength of collaborative ties, reciprocity, fairness in the distribution of resources, impartiality in the delivery of justice, and wise and compassion-

Table 2
Enhancement of Trust Across Multiple Levels of Analysis

Level of analysis	Sample constructs	Illustrative assessment/intervention approaches
Neurophysiology	Neurochemistry: oxytocin, dopamine, endorphin receptor density Neurological substrates: anterior insula/cingulate, amygdala	Assessment of neurophysiological capacity for positive social relations Pharmacological treatment
Individual	Interpersonal awareness, perspective-taking, connection, generosity, and empathy	Assessment of emotional intelligence Training in empathy, social awareness, social skills, and attention to relationship strengths
Families/small combat units	Acceptance of the diversity of life-style choices, mutuality, sharing of resources, generativity	Family interaction and social network analyses Family therapy to resolve conflicts and restore mutuality Social interventions to enhance communication Diversity training to foster inclusion and reduce isolation
Communities/battalions	Collaborative ties, reciprocity, fairness, justice, impartiality, leadership	Assessment of social capital, distribution of resources, diversity Interventions focused on group identity, strength-based initiatives, and grass-roots collaboration fostering community development and sustainable and inclusive social networks

ate leadership. These qualities are thought to describe the amount of social capital available to develop and sustain communities through adversity (Coleman, 1990; Klinenberg, 1999; Putnam, Felstein, & Cohen, 2003). One important difference between military and civilian communities, for example, the battalion versus a neighborhood, is that members of combat units migrate in and out more quickly yet share a stronger social identity and unified sense of purpose compared with other groups. The transient nature of these groups presents a special challenge to creating social resilience. At the same time, the common collective identity presents a special opportunity. In the military, leadership training, promotion of values of fairness and social responsibility throughout, emphasis on the valued social identity they share, and close attention to military discipline and hierarchies promote a coherent sense of community. The new attention to resilience training in the Army is an example of system-wide reform aimed at providing a greater understanding of the fundamental ingredients of a successful military experience, getting beyond survivorship and individual advancement, and including camaraderie and good stewardship (Hames, 2009). The outcome of those efforts will depend, of course, on implementation of assessment and interventions on systemic influences as well as the training of recruits.

There are a number of examples of community approaches to social resilience. In the Experience Corps (Fried et al., 2004), retired senior citizens help young children within inner-city schools. The seniors are provided a way to participate meaningfully in bettering the lives of children in their community. In turn, the children have a surrogate, caring grandparent who watches over them dur-

ing part of the school day. The Health in a New Key program (St. Luke's Health Initiatives, 2008), the Healthy Communities Initiatives by the World Health Organization (1997), as well as the National Civic League's All-American Cities awards and its development of the Civic Index (National Civic League, 1999) all reformulate health as the presence of social strengths to aid in recovery from illness and sustain well-being.

Family therapists recognized long ago that the restoration of hope in social units does not succeed through exclusive attention to alleviation of psychological distress from ongoing conflicts; it is also critical to broaden the family's perspective on the sources of social goods within the family in spite of its troubles (e.g., Dattilio, 2005; Minuchin, Lee, & Simon, 1996). On a broader scale, social connectedness and cohesion are linked to greater vitality and stability in communities (Langdon, 1997), and indicators of social capital have been associated with beneficial health outcomes (Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Veenstra et al., 2005). In contrast, inequality and prejudicial treatment are associated with poorer health and life expectancy (Mays, Cochran, & Barnes, 2007).

Social Resilience in the Comprehensive Soldier Fitness Program

The social resilience component of the Comprehensive Soldier Fitness program includes four 15-minute modules developed on the nine personal resources outlined in Table 1. Although each module draws on more than one of the resources in Table 1, each module was designed to stimulate an awareness of and an appreciation for one or more

specific personal resources. For instance, the first module features several personal resources, including "feeling connected to other individuals and to collectives" (e.g., a group, squad, or team), "perceiving others accurately and empathically," and "adopting values that promote the welfare of self and others." The concept of social resilience is introduced, the soldier's focus on himself or herself is addressed, and the soldier is refocused on his or her role as a member of a larger team, going from "me" to "we" (a theme also encountered in the social awareness effects of spiritual resilience, as discussed by Pargament and Sweeney, 2011, this issue). Connections between social resilience and the Army's seven core values (loyalty, duty, respect, selfless service, honor, integrity, and personal courage) are detailed at the individual and unit levels of organization, and how these connections can increase social resilience and advance group outcomes are noted. The point is made that soldiers are more likely to fight effectively and adapt to the hardships and challenges they will confront if they are more inclusive about those around them—their team—rather than simply considering themselves.

One obstacle to social resilience is viewing others as different from oneself and, therefore, as outgroup members who represent a threat rather than a resource. The second module addresses this obstacle and illustrates how differences among the members of a squad or team can make that group stronger, more adaptable, and more resilient. Awareness is also created of the possibilities that squad or team chemistry can be more important than the strength and talent of the individual warriors and that diversity on various dimensions can increase the adaptability of the group in the face of new problems and challenges. The resource of "tolerance and openness" (see Table 1) serves as the primary foundation for this module.

In the third module, information is provided about the inherent need to belong and to form meaningful connections with others as well as the tendency in humans to mimic each other, to affiliate and communicate with one another, and to transmit emotions to one another. The module provides hands-on experience with the value of inclusion and the cost of exclusion, and practice is provided in perspective taking, empathy, regulating one's own emotions, and supporting one another. This module underscores the notion that people influence one another both intentionally and unintentionally, and this influence can be positive or negative. The point is again made that soldiers fight more effectively and deal more effectively with the challenges they will confront if they think and act as a team rather than simply considering themselves. Evidence is reviewed that a focus on "we" rather than "me" has risks but that it can also buffer the effects of traumatic stressors soldiers may confront and help them learn and grow from those stressors. In doing so, the module draws most on three resources: "feeling connected to other individuals and collectives," "the ability to respond appropriately to social problems," and "expressing social emotions appropriately and effectively." The experiential nature of this module is designed to reinforce the material covered in the prior

modules and to motivate the soldiers to take the lessons learned from these modules and apply them in their everyday lives.

The final module is focused on social skills development and provides specific information on how to create alliances with others. The resources that serve as foundations for this module include "communicating caring and respect to others," "perceiving others' regard for the self," and "values that promote the welfare of self and others." This module introduces the ABCDEs of good listening: (A) attend with genuine interest; (B) be responsive to what is said; (C) care about the other person and accept that their perceptions reflect how things look from their perspective; (D) don't interrupt, but instead wait until they are finished; and (E) encourage the person to say more and to feel safe in speaking to you as confidant.

Enjoying good times together is important to friendship, but sharing difficult experiences is the glue that cements social bonds The final module acknowledges that wartime will involve both good times and bad times, and it walks the troops through what it means to be a good friend and team member in difficult circumstances. Finally, the troops are exposed to information and perform tasks that are designed to underscore the importance of trust in resilient social relationships. Among the resources that undergird this module are "the capacity and motivation to perceive others accurately and empathically," "communicating caring and respect to others," and "trust."

Limitations

Although the nine personal resources upon which this program is built were based on the extant research, there are at least four significant limitations to the social resilience modules in this educational, computer-based program. First, these modules provide information about social emotions, skills, and interactions, but the educational and computerized nature of the program precludes implementation of real-life social interactions in the modules. On the positive side, the computerized nature of the Soldier Fitness Tracker (see Fravell, Nasser, & Cornum, 2011, this issue) should provide baseline information about the soldier's social integration and engagement, and it should permit follow-up analyses to determine whether improvements on these dimensions were observed (or for whom they were observed) following completion of the social resilience modules. It may also make it possible to construct natural experiments in which the social resilience of troops who were exposed to traumatic events is compared with that of others with similar backgrounds and training who were not exposed to traumatic events to determine whether those who had previously scored well on the social dimensions of the Global Assessment Tool did better following the stressor, relative to the matched comparison group, than those who had scored poorly on these dimensions, relative to the matched comparison group.

Second, these modules represent a form of translational research—taking what is known from laboratory and clinical research and applying it to address a specific social problem. The term *translational research* has the word

"research" in it because such efforts are more likely to succeed when the translation of the basic research to an applied problem is part of a research program that includes randomized control studies, evaluation of treatment efficacy, and iterative revision of the program to improve its efficacy and generalizability. To date, even pretesting has not been possible. Data from the program should provide valuable evidence regarding the challenge of building social resilience among the troops, especially if translational research becomes a central component of the program. Again, the Soldier Fitness Tracker makes such research possible, but what is possible will not be sufficient for the vision of Comprehensive Soldier Fitness to be realized (see Casey, 2011, this issue; Cornum, Matthews, & Seligman, 2011, this issue).

Third, social resilience is a multilevel construct, but the educational, computer-based program into which these modules fit targets only the individual level of organization—the individual soldier. Thus, the modules on social resilience focus on fostering the personal resources that promote social resilience, although an explicit effort is made in these modules to make the soldiers aware of the broader level of social resilience they must also strive to achieve. Interventions at the group level would also be worthwhile. Such organizational interventions focus on the context, aiming to improve the contingencies in place that support and/or constrain social fitness. As the Comprehensive Soldier Fitness program unfolds, such interventions might be worth considering.

Finally, the program may increase the average level of social resilience within the troops, but a shift in the mean does not imply that those at the bottom of the distribution of social resilience showed significant improvement. Given that this group may be at the greatest risk for problems such as posttraumatic stress disorders and suicide, special attention should be given to evaluating the effects of the program on those who need it most. This should be possible given the number of soldiers who will be going through this training and whose outcomes will be quantified in the dataset generated by the Soldier Fitness Tracker.

Conclusion

The key to resilience is not individual strengths alone. As Charles Darwin (1871/2004) noted when considering the limits of the principle of the survival of the fittest (individual),

a tribe including many members who, from possessing a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to aid one another, and to sacrifice themselves for the common good would be victorious over most other tribes; and this would be natural selection. (p. 166)

Social resilience depends on the development of greater awareness of our connections with others and multiple capacities for social action that can lead to the attainment of both personal hopes and social purposes. Choices informed by social connection as well as personal values lead to resilient outcomes that are sustainable with respect to the social worlds in which we live as well as personal motivations for success and long life.

We offer one example of a program to further social resilience. Though designed only for Army recruits, we think the modules described here could be tailored to fit other social arenas and potentially yield sizeable benefits. Nevertheless, great promise needs to give way to careful testing of the efficacy of these programs to assure us that the interventions enhance the capacities of people to face calamities better as a group than they could alone.

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